

REMARKS

The Final Office Action mailed October 19, 2007, has been received and reviewed. Claims 1 through 4, and 8 are currently pending in the application. Claims 1 through 4, and 8 stand rejected. Applicant proposes to amend claim 1, and respectfully requests reconsideration of the application as proposed to be amended herein.

Information Disclosure Statement(s)

Applicant notes the filing of an Information Disclosure Statement herein on November 21, 2005 as reflected in PAIR, and notes that no copy of the PTO/SB/08 was returned with the outstanding Office Action. Applicant respectfully requests that the information cited on the PTO/SB/08 be made of record herein.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 6,319,317 to Takamori

Claims 1 through 3 and 8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,319,317 to Takamori (“Takamori”). Applicant respectfully traverses this rejection, as hereinafter set forth.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” M.P.E.P. § 2131 (Aug. 2001) (*quoting Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Id.* (*quoting Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1051, 1053 (Fed. Cir. 1987)). In addition, “the reference must be enabling and describe the applicant’s invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention.” *In re Paulsen*, 30 F.3d 1475, 1479, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994).

Applicant submits that Takamori does not and cannot anticipate under 35 U.S.C. § 102 the presently claimed invention of independent claim 1, and claims 2-3 and 8 depending therefrom, because Takamori does not describe, either expressly or inherently, the identical inventions in as complete detail as are contained in the claims.

Generally, Applicant's invention as presently claimed recites a system for measuring a thickness in a z-dimension while, in contrast, Takamori discloses a camera for creating an image in the x and y dimensions. Note: Takamori does not disclose a 3-dimesional camera nor a z-directional analysis of an x and y dimension image.

Specifically, Applicant's invention as presently claimed recites , in part, a "system ... comprising: a platform ... [and] a sensing system ... further configured to continuously directly measure in a dimension substantially orthogonal to the platform a surface level ... on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform" The Examiner in the Response to Arguments section of the Office Action *implies* disclosure in Takamori that would contradict the *actual* disclosure of Takamori. Specifically, the Office Action alleges:

Additionally, the measurement in Takamori are taken in a dimension substantially orthogonal to the substrate (the sensor is positioned and aim in a straight line above the substrate.) (See figures, and the relative positions of item 105 and the substrate/wafer). (Office Action, p. 7).

While the Takamori sensor may be so positioned, the Takamori sensor does not so function or measure. Specifically, while the Takamori sensor may capture a two-dimensional image (x and y dimensions) from a location above the substrate, the Takamori sensor does not take a *measurement* in a dimension substantially orthogonal to the substrate as claimed by Applicant. At best, Takamori's capturing of an image above the substrate results in *measurements* in the x and y dimensions and not in a z-dimension. Specifically, Takamori discloses:

... detecting sensor 105 for detecting a spreading state of an outline of the outer periphery of the resist solution when the resist solution is discharged onto almost the center of the rotated wafer W and the resist solution spreads out from almost the center of the wafer W toward the outer edge. As this detecting sensor 105, for example, a CCD camera can be used. (Takamori, col. 8, lines 30-36).
... the spreading state of the outline of the outer periphery of the resist solution R is detected by the detecting sensor 105 such as a CCD camera or the like (Takamori, col. 9, lines 44-46).

The "sensing system" of Takamori clearly is **not** "configured" ... to continuously *directly measure in a dimension substantially orthogonal to the platform a surface level* ... on the upper

surface according to direct measurements in the dimension substantially orthogonal to the platform” as claimed by Applicant. Therefore, Takamori cannot anticipate under 35 U.S.C. § 102 Applicant’s invention as presently claimed in amended independent claim 1 from which claims 2-3 and 8 depend. Accordingly, Applicant respectfully requests the rejections be withdrawn.

Furthermore, in the Response to Arguments section of the Office Action, the Examiner alleges that Applicant’s “directly measuring” claim language “is considered to be an *intended use* step”. (Office Action, p. 7). Applicant respectfully disagrees. Applicant’s “directly measuring” claim language was and continues to be functional claim language further defining the capabilities of Applicant’s “sensing system.” In order to further clarify such functional claim language, Applicant has amended independent claim 1 to recite, in part, “the sensing system *further configured to continuously directly measure* in a dimension substantially orthogonal to the platform a surface level” Therefore, Takamori still does not anticipate under 35 U.S.C. § 102 Applicant’s invention as presently claimed in amended independent claim 1 from which claims 2-3 and 8 depend. Accordingly, Applicant respectfully requests the rejections be withdrawn.

Therefore, since Takamori does not describe, either expressly or inherently, the identical inventions in as complete detail as are contained in the claims, Takamori cannot anticipate under 35 U.S.C. § 102 the presently claimed invention of independent claim 1, and claims 2 and 4 depending therefrom. Accordingly, Applicant respectfully requests the rejections be withdrawn.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori and U.S. Patent No. 6,270,579 to Subramanian et al.

Claims 1 through 3, and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori and U.S. Patent No. 6,270,579 to Subramanian et al. (“Subramanian”). Applicant respectfully traverses this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, there must be “a reason that would have

prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Finally, to establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant's disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The 35 U.S.C. § 103(a) obviousness rejections of claims 1 through 3 and 8 are improper because the elements for a *prima facie* case of obviousness are not met. Specifically, the rejection fails to meet the criterion that the prior art reference must teach or suggest all the claims limitations and there is no reason that would have prompted a person of ordinary skill to combine the references as the combination would destroy the reference for its intended purpose.

Regarding the cited references failing to teach all of the claim limitations, Applicant respectfully asserts that neither Takamori nor Subramanian, either individually or in any proper combination, teach or suggest Applicant's invention as presently claimed in amended independent claim 1.

The Office Action continues to cite Takamori for the alleged teachings as stated above with reference to the 35 U.S.C. § 102 rejections, however, the Office Action concedes:

It can be argued that the Takamori does not go as far as applicant does in defining the sensor techniques, especially with respect to how the sensor measures the thickness. However, Subramanian disclose further details of a sensor that monitors the surface and spreading state of a dispense. The sensor includes a transmitter (item 68) driven by light driver 66, which is directed towards the substrate surface and generates thickness uniformity data which is received by receiver 70 which feeds into measurement system 72 (see column 6, lines 31-59). *This [Subramanian] sensor directly measures a surface level of the material being deposited on the upper surface until the surface level of the material is directly measured to be a specific thickness of the material* (as shown in step 210 of Figure 7, and see column 9, lines 30-35 (Office Action p. 5; emphasis added.)

Applicant respectfully asserts that Applicant's previous arguments regarding the

shortcomings of the teachings of Subramanian have apparently been entirely ignored. Applicant respectfully asserts that Subramanian does not teach “*directly meas[ing] ... material being deposited ... until the surface level of the material is directly measured to be a specific thickness*” as alleged in the Office Action. At the Office Action’s specific citation of column 9, lines 30-35 and the teachings immediately preceding the citation of Subramanian, it is very clear that Subramanian teaches *measuring material that has ceased to be deposited* as the material being measured is “developed” (i.e., hardened) in a preceding step 190 of Subramanian’s Figure 7. Specifically, Subramanian teaches:

The measurement system 72 then *measures the thickness of the developed photoresist material layer* 50 on the wafer 52 at various locations along the wafer 52 in step 200. In step 210, the processor 64 compares the measured thickness uniformity with the desired thickness uniformity, and determines whether or not the proper thickness uniformity has been achieved within predefined tolerances. If no, the processor 64 enters a routine to reconfigure the path in step 215. In step 220, the processor 64 stores the previous or reconfigured path values to be used for the next wafer. (Subramanian, col. 9, lines 26-36; emphasis added.)

Clearly Subramanian, like Takamori as argued above, also fails to teach or suggest Applicant’s claim element of a “*sensing system further configured to continuously directly measure in a dimension substantially orthogonal to the platform a surface level of a material being deposited on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform until the surface level of the material is directly measured* to be a specific thickness of the material”, as recited in Applicant’s amended independent claim 1.

Therefore, since neither Takamori nor Subramanian teach or suggest Applicant’s claimed invention including a “*sensing system further configured to continuously directly measure in a dimension substantially orthogonal to the platform a surface level of a material being deposited on the upper surface according to direct measurements in the dimension substantially orthogonal to the platform until the surface level of the material is directly measured* to be a specific thickness of the material”, these references, either individually or in any proper combination, cannot render obvious, under 35 U.S.C. § 103, Applicant’s invention as presently claimed in amended independent claim 1. Accordingly, Applicant respectfully requests the

rejection of presently amended independent claim 1 be withdrawn.

Regarding a lack of reason that would have prompted a person of ordinary skill in the art to combine the references, Applicant respectfully asserts that any proposed combination would destroy the cited reference for its intended purpose. Specifically, Takamori teaches of monitoring distribution of resist on a rotating wafer using analysis techniques in the X and Y dimensions. Specifically, Takamori teaches:

- ... detecting a spreading state of an outline of the outer periphery of the resist solution when the resist solution is discharged onto almost the center of the rotated wafer W and the resist solution spreads out from almost the center of the wafer W toward the outer edge. As this detecting sensor 105, for example, a CCD camera can be used. (Takamori, col. 8, lines 30-36).
- ... the spreading state of the outline of the outer periphery [x-y dimension] of the resist solution R is detected by the detecting sensor 105 such as a CCD camera or the like and the detected information [x-y dimension] is input to the unit controller 110. The unit controller 110 calculates the spreading speed of the outline [x-y dimension] of the outer periphery of the resist solution R from the detected information and discriminates whether or not the spreading speed of the outline [x-y dimension] is not more than a predetermined speed (Takamori, col. 9, lines 44-52).

Clearly, the substitution of Subramanian's sensor system that teaches to "*measure[] the thickness of the developed photoresist material layer 50* on the wafer 52" (Subramanian, col. 9, lines 26-27) in a z-dimension into Takamori with its all-encompassing teaching of calculations in the x and y dimensions, unquestionably destroys Takamori for its intended purpose of "*detecting* a spreading state of *an outline of the outer periphery* of the resist solution". Therefore, since the alleged combination changes the principle operation of the primary reference and additionally renders the reference inoperable for its intended purpose, the combination is improper. (M.P.E.P. 2143.01). Accordingly, Applicant respectfully requests the rejections be withdrawn.

The nonobviousness of independent claim 1 precludes a rejection of claims 2, 3 and 8 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claim 1 and claims 2, 3 and 8 which depend therefrom.

Obviousness Rejection Based on U.S. Patent No. 6,319,317 to Takamori and U.S. Patent No. 6,270,579 to Subramanian et al., and Further in View of U.S. Patent No. 6,642,155 to Whitman et al.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Takamori and Subramanian, as applied to claims 1 through 3, and 8 above, and further in view of U.S. Patent No. 6,642,155 to Whitman et al. (“Whitman”). Applicant respectfully traverses this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of claim 4 which depends therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to dependent claim 4 as independent claim 1 is allowable.

ENTRY OF AMENDMENTS

The proposed amendments to claim 1 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search. Finally, if the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

CONCLUSION

Claims 1 through 4, 8 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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